

AU/AWC/170/1999-04

AIR WAR COLLEGE

AIR UNIVERSITY

1 AUGUST 1943 – TODAY’S TARGET IS PLOESTI:
A DEPARTURE FROM DOCTRINE

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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April 1999

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Preface

This work is written to honor not only those brave airmen that fought that fateful day over Ploesti, but for all Americans who have answered the call to defend and preserve the rights and freedoms that we enjoy in the United States. For those who perished, this work represents my personal tribute to their memory, and my deepest sorrow to the families and friends who have had to endure a lifetime of emptiness without their loved ones. Ploesti represented the true courage and gallantry of American airmen in the face of impossible odds, yet they carried out their mission as best they could, knowing full well the importance of their target to the Nazis. Each of them believed that their success would hopefully shorten the war and save the lives of fellow Americans. For all those Americans, so impacted throughout our history – may we never forget!

To successfully complete a work of this depth requires the guidance and assistance of others. Special thanks to my advisor, Colonel Chuck Holland, whose positive critique and direction always kept my efforts focused on the successful completion of this project. Also, for my wife, Gayle, and my “little ones,” Patrick, Kate, and Meghan, my love and appreciation for their understanding and personal sacrifices during the long hours of research and writing required to finish this paper. They are, and have always been, my greatest source of strength and inspiration!

Abstract

The focus of this paper will be on the 1 August 1943 bombing raid on the Ploesti oil field and refineries by an American task force composed of bombardment groups of the Eighth and Ninth Air Forces. The Ploesti raid stood apart from the rest of the war in the air. The idea for it, and the unusual tactics employed, came from the top; it generated from General Arnold's headquarters and was approved by President Roosevelt. Winston Churchill called Ploesti "the taproot of German might." It was not a part of any particular campaign, but was considered vital in itself. It was painstakingly planned and executed relatively quickly by the best-prepared and most experienced force available at the time. It was also fought with unparalleled bravery, the sole action of the war for which five Congressional Medals of Honor were awarded. The purpose in examining Ploesti is to first gain a complete understanding of the events leading to the planning for the raid, the raid itself, and finally the impact on the Germans in its aftermath. With this established, the intent is to assess the raid while keeping one fascinating question in mind – after building a doctrine for twenty years based on high altitude, daylight, precision bombing, why, in its first major bombing effort, did the United States "depart from doctrine" and conduct a low level bombing mission on Ploesti, the only low-level bombing mission conducted in the war?

Chapter 1

Air Power – The Fight for Recognition

Most historians agree that World War II (WWII) represented the unfinished part of the First World War--the result of a failure to crush those military powers seeking world conquest, who had now developed a super-race mentality.¹ It started as a localized conflict with the German invasion of Poland, 1 September 1939, and expanded until it merged with the Japanese attack on Pearl Harbor, 7 December 1941, to form a global war of immense proportions.² The primary combatants pitted the Axis Powers (Germany, Italy, and Japan) against the Allies (United States, Great Britain, and Soviet Union), although there was ultimately no shortage of participants. The stakes--world domination by the Axis, preservation of freedom for the Allies. Thus, with the dawn of 1942, Great Britain and the United States struggled to devise a plan to defeat Germany; one that would include a new concept--strategic bombing.

Strategic Concept and Doctrine

Strategic bombing can be viewed as a relatively autonomous process. It is intended to be decisive in its ability to destroy the central war-making capabilities of an enemy.³ Its unique advantage lies in its high degree of flexibility--it does not have a fixed position in battle. Strategic forces, instead, can attack, regroup and rearm at their home bases, and then attack again, over and over.⁴ Of course, this assumes that variables such as enemy

actions, the weather, and your supply and logistics support are either favorable and/or under control.

During the 1920's and 1930's General Douhet, General Mitchell, and Lord Trenchard emerged as the world's leading exponents of air power. Their concepts concerning use of the bomber, civilian will as a center of gravity, target selection, and precision bombing, set the framework for the strategic planning and application of air power in WWII.

Douhet set his sights squarely on the strategic role of bombardment aircraft. He argued that a small bomber force could fight its way through any defense, and by dropping gas bombs, virtually exterminate an enemy population.⁵ He believed that air defense against bombers was futile and the most important targets were urban centers where the people's will could be crushed.⁶

Mitchell believed that an air force must defeat the opposing air force to win control of the air; then it should strike at production and transportation centers.⁷ The bomber was the primary instrument of air power, and Mitchell thought that a few "precisely dropped" bombs would cause tremendous destruction. He felt that people could not stand up to the stress of bombing and that industry could not recover from attack.⁸

Trenchard proposed that the heart of air power lay in strategic bombing as an independent function. Any operations in direct support of the army and navy were considered diversionary.⁹ Any fighter defense against bombing was fruitless. Trenchard believed that the psychological effects of bombing outweighed the material effects at a ratio of twenty to one.¹⁰

Although each of these three airmen's philosophies varied slightly, the main theme was the same. Strategic bombing would dominate warfare in the future. In the United States, their beliefs were further refined at the Air Corps Tactical School and became American doctrine as Air War Planning Document (AWPD)-1 before the war and AWPD-42 shortly after entering the war.¹¹ Both of these plans bore a close resemblance to the joint British/American Combined Bomber Offensive (CBO) plan that helped carry the Allies to final victory in Europe. (see Appendix)

Political and Military Leadership

President Roosevelt and Prime Minister Churchill really did not understand the scientific and technical aspects of air power, nor did they appreciate that strategic bombing was also subject to the same consequences from war as that of naval and ground operations.¹² Therefore, strategic bombing did not enjoy official recognition in Allied war plans except in preparation for the invasion of Western Europe, or as an activity undertaken to provide similar type support.¹³

The lukewarm support for strategic bombing at senior levels soon became evident as the United States entered the war. Brigadier General Eaker reported to England in March 1942 to initiate the establishment of VIIIth Bomber Command, the primary component of the Eighth Air Force.¹⁴ Major General Spaatz arrived in May, as Commanding General, Eighth Air Force, at the same time as the new Commanding General, European Theater of Operations, Major General Eisenhower.¹⁵ General Eisenhower's marching orders were signed by General Marshall, Army Chief of Staff, and were prepared by the Operations Division of the War Department General Staff--strategic bombing was not addressed.¹⁶ On the other hand, General Spaatz received his directions from General Arnold,

Commanding General Army Air Forces--his instructions also carried no specific details for conducting a strategic bombing offensive.¹⁷

The search for recognition ended at the Casablanca Conference in January 1943 with the directive for a strategic air offensive against Germany. For the Americans, high altitude, daylight, precision bombing took center stage in the war as the most direct means of attacking the Nazi war machine. The first and most difficult test of American air power came in August 1943 with the raid on Ploesti, Rumania, by 178 B-24 Liberators based in North Africa.¹⁸ The Ploesti raid stood apart from the rest of the war in the air. The idea for it, and the unusual tactics employed, came from the top; it generated from General Arnold's headquarters and was approved by President Roosevelt.¹⁹ Winston Churchill called Ploesti "the taproot of German might".²⁰ It was not a part of any particular campaign, but was considered vital in itself. It was painstakingly planned, and executed relatively quickly by the best-prepared and most experienced force available at the time.²¹ It was also fought with unparalleled bravery, the sole action of the war for which five Congressional Medals of Honor were awarded.²²

Ploesti

Many consider the significant birth of Ploesti to be 1856 when the first oil refinery was built.²³ A small town north of Bucharest, Ploesti was the ideal target; fragile, concentrated, vital.²⁴ It was the source of 60 percent of Germany's crude oil supply.²⁵ Germany had little natural oil, but Rumania's was plentiful and of high quality, and fed the Nazi war effort's high demand for fuel oil, lubricants, and high-octane gasoline. Ploesti's refineries produced ten million tons of oil each year, which included 90-Octane aviation fuel, considered to be the highest quality in Europe.²⁶ To stress the importance

placed on Ploesti by the Germans, Hitler's Chief of Staff, General Jodl, felt that no success the Russians could achieve on the eastern front would equal the disastrous effects if the Rumanian oil fields were captured; Hitler himself believed that if the Ploesti refineries were destroyed, the damage would be irreparable.²⁷ Therefore, it was no wonder that Allied air commanders looked at Ploesti and longed to destroy it.²⁸

Purpose and Intent

The focus of this paper will be on the 1 August 1943 bombing raid on the Ploesti oil fields and refineries by an American task force composed of bombardment groups of the Eighth and Ninth Air Forces. The purpose in examining Ploesti is to first gain a complete understanding of the events leading to the planning for the raid, the raid itself, and finally the impact on the Germans in its aftermath. With this established, the intent is to assess the raid while keeping one fascinating question in mind – after building a doctrine for twenty years based on high altitude, daylight, precision bombing, why, in its first major bombing effort, did the United States “depart from doctrine” and conduct a low level bombing mission on Ploesti, the only low-level bombing mission conducted in the war? In order to effectively investigate this question however, it is first important to understand the overall strategic bombing effort during the war.

Notes

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Chapter 2

Strategic Bombing – Helping to Win the War

To the more perceptive senior officers of the Luftwaffe, the handwriting was on the wall--their main task would soon be to defend the Reich against aerial attacks so devastating that not even Adolf Hitler could ignore it.¹ This was the main concern of the German Air Force at a Berlin meeting held roughly at the same time as the Casablanca deliberations in January 1943. On 16 April 1945, when the Headquarters of the United States Strategic Air Forces (USSTAF) issued an order ending the strategic air war in Europe, their worst fears were realized.² Most all experts agree that by March of 1945, central Germany had suffered such destruction as to be on the verge of total collapse. The Nazi's could not conduct the essential functions of corporate life, much less carry on the war. Both the German industrial capacity and their national economic structure were decimated.³

The Road to a CBO

The development of the CBO was the result of an evolutionary process whose genesis took the form of the AWPDP-1, later refined by AWPDP-42. Both AWPDP-1 and AWPDP-42 were requirements plans for strategic bombing designed to describe what should be accomplished and with what resources.⁴ In the summer of 1941, the word coming down, strongly supported by General Arnold, was that President Roosevelt was

looking for a strategic air offensive plan in case the United States became involved in the war in Europe.⁵ This plan, AWPD-1, proposed a strategic bombing offensive designed to weaken Germany's war-making capability, thus allowing for an invasion of Western Europe if necessary.⁶

On 25 August 1942, one year after the development of AWPD-1, President Roosevelt again requested an estimate of the aircraft requirements needed to carry on an air offensive against Germany.⁷ This revised plan, designated AWPD-42, called for the combined effort of the United States Army Air Forces (USAAF) and the British Royal Air Force (RAF).⁸ The USAAF would focus on daylight bombing of precision objectives, while the RAF would concentrate on night bombing of area objectives.⁹ As with AWPD-1, AWPD-42's primary purpose was to destroy Germany's capability to sustain itself and continue the fight by destroying its war-supporting industries and related economic systems through which its war machine functioned and its civilian population flourished.¹⁰

The Casablanca Directive

When President Roosevelt and Prime Minister Churchill met with their Combined Chiefs of Staff at Casablanca in January 1943, clearly the headline story from their conference was the Allies demand for the unconditional surrender of Germany.¹¹ For airmen, however, there was a much more important development--the Casablanca Directive. Under this directive, the purpose of the air offensive against Germany was "to bring about the progressive destruction and dislocation of the German military, industrial, and economic system and the undermining of the morale of the German people to a point where their capacity for armed resistance was fatally weakened."¹² Within this directive,

it was understood that at an appropriate time, the Strategic Air Forces would be temporarily used by the Supreme Commander, Allied Expeditionary Forces, in direct preparation for the invasion of Western Europe planned for Spring 1944.¹³ Thus, with the Casablanca Directive defining the overall objective of the air offensive, a new combined strategic air plan needed to be developed, and that plan would be the CBO.

The CBO is Born

Following the Casablanca Conference, the CBO planning team set about the task of developing a capability plan, unlike AWPD-1 and AWPD-42 which were requirement plans, to describe what should be done to satisfy objectives with the forces already identified in production.¹⁴ CBO did not officially start until 10 June 1943 with the issuance of the POINTBLANK Directive, an operations guide for the USAAF and RAF bombing fleets.¹⁵ For the American air offensive, built upon a precision-bombing principle, the directive listed specific target groups in priority order. However, the RAF's commitment to the POINTBLANK program was tentative at best. While the USAAF would bomb specific industrial objectives during the day, RAF Bomber Command would hit the cities associated with those objectives at night; however, the British would attack the POINTBLANK target categories only as far as they deemed feasible.¹⁶ In any case, these associated cities were many times targeted for destruction as part of an American objective anyway. More importantly, both air forces were in agreement that the German fighter was their most dangerous enemy and this objective deserved highest priority.¹⁷ So, with a mutual concurrence of interest rather than a closely coordinated campaign, the CBO began in mid-1943.

Political and Military Strategy

President Roosevelt and Prime Minister Churchill both saw the primary purpose of the CBO much differently than did their airmen. They viewed the real objective of the bombing offensive as one of paving the way for a possible invasion of Western Europe, thus leading to the final defeat of Germany.¹⁸ This objective was a great concern to them since their Soviet ally, Marshal Stalin, refused to attend the Casablanca Conference. He claimed that he had been promised a European second front by Spring 1942.¹⁹ The situation on the Russian front was critical, and Stalin adeptly manipulated Allied fears in demanding that a second front be initiated to relieve the pressure against his armies.²⁰ Thus, President Roosevelt and Prime Minister Churchill viewed the fatal weakening reference in the Casablanca Directive as meaning the disruption/destruction of the German military system that would oppose the Allied invasion and final combined operations on the continent.²¹

Senior Allied Air Force leadership firmly believed that the potential decisiveness of strategic bombing best served the main objective; the defeat of Germany. They saw strategic air power's ability to strike at the heartland of Germany, via sustained, massive bombings of key industrial targets, as the most effective way to end the war.²² Therefore, they considered any redirection of strategic air forces in support of invasion operations such as in North Africa²³ and the Mediterranean²⁴ as severely undermining their ability to effectively maintain the air offensive against German industry. For the commanders and CBO planners, the effect of this *scatterization* was demoralizing.²⁵ For the Allied aircrews who were now regularly battling the Nazi's over occupied Europe and German air space, it meant that they were at a distinct numerical disadvantage against increasingly

effective German fighter opposition.²⁶ However, political necessity proved stronger than military strategy. The American people understood invasion--they did not understand the potential decisiveness of strategic bombing.²⁷

The CBO Campaign

Mission

The CBO mission as prescribed at Casablanca was implemented in mid-1943 as the plan of operations for the strategic air forces of both the RAF and USAAF²⁸ against the heartland of Germany. Now that military invasions of the continent were becoming possibilities, it more or less followed that the objective of strategic bombing should be to pave the way for them by weakening the enemy's heart.²⁹ As such, the Casablanca Directive made it clear that strategic bombing was not expected to win the war on its own, but that it was meant to produce a situation in which victory could be won by the armies.³⁰

Objectives/Targets

In support of the overall war objective--the defeat of Germany--the CBO's top priority objectives included: (1) the German aircraft industry, (2) submarine construction yards and bases, (3) ball bearings, (4) petroleum refineries and synthetic plants, (5) rubber synthetic plants, and (6) military transportation.³¹ Of high priority within the German aircraft objective was the depletion of rapidly augmented German fighter strength³²--the chief threat to a bomber crew's longevity. CBO objectives closely resembled those of AWPD-1 and AWPD-42 (see Appendix). All three plans were essentially the same in strategic context. One noticeable change from AWPD-1 to the

final CBO plan was in the total number of targets identified for destruction; the 191 total targets identified under AWPD-1 were refined to 76 basic targets under CBO due to the growing experience of the Allies in assessing their objectives. (see Appendix) The electric power objective produced the most second-guessing; it was in second place on AWPD-1 and completely dropped from the CBO's top six priorities.³³ In hindsight, nearly all authorities agreed that effective disruption of the German electric power system would have greatly added to the chaos that was then growing in Germany.³⁴ Concerning Allied targeting in general, German Reich Marshal Speer commented ..."in those days, we anxiously asked ourselves how soon the enemy would realize that he could paralyze the production of thousands of armaments plants merely by destroying five or six relatively small targets."³⁵ Thus, the CBO plan itself was relatively straight forward; how the participants chose to accomplish objectives varied according to their own doctrine.

Forces and Capabilities

The CBO involved the combined bomber capabilities of both the RAF and the USAAF in a sustained effort to provide round-the-clock strategic bombing against Germany. This happened to fit well into existing doctrine since the RAF favored night bombing while the Americans supported daylight efforts. The RAF's earlier foray into daylight bombing of selected targets proved disastrous in the face of a determined Luftwaffe.³⁶ British heavy bombers (Lancasters and Sterlings) were lightly armed, the tradeoff for greater bombload capability, and as such the RAF believed that their survival was enhanced in night operations.³⁷ With night attacks also went area type bombing intent on striking at the morale and will of the German people.³⁸ The Americans, in turn, followed a doctrine of precision, high altitude, daylight bombing, bent on the destruction

of selected vital industrial targets.³⁹ They too faced the same relentless attack from the Luftwaffe. They believed that their heavily armed bombers (Flying Fortresses and Liberators), flying in concentrated, tight formations, could survive attack and effectively hit their targets.⁴⁰

Resources Available

For the Americans, their force buildup was planned in four phases so as to complete the fatal weakening in preparation for the mid-1944 invasion: Phase I - 800 heavy bombers on hand by July 1943; Phase II - 1,192 heavy bombers on hand by October 1943; Phase III - 1,746 heavy bombers on hand by January 1944; Phase IV - 2,702 heavy bombers in total.⁴¹

By June 1944, the Allied total force stood at over 4,000 heavy bombers. RAF Bomber Command had 1,000 planes, Eighth Air Force had 2,000 with two crews for each bomber, and Fifteenth Air Force had 1,200 bombers, also with two crews per aircraft.⁴²

Highlights; 1942-1945

The Allied effort as a combined bombing force was slow in mounting following the Casablanca Conference. The RAF emerged from 1942 with several major bombing raids under their belt: Cologne was bombed by 1,046 aircraft, Bremen by 1,006, Essen by 956, and Dusseldorf by 630.⁴³ The Americans, however, were suffering from *scatterization* as General Eisenhower diverted heavy bombers from the European air offensive to support ground operations in the Mediterranean.⁴⁴ As a result, by November 1943, there were only 800 heavy bombers or 66 percent of the scheduled build-up dedicated to the CBO.⁴⁵

In addition, when in the air, the Americans found unescorted, daylight missions deep into Germany to be extremely costly--Nazi air defenses were fierce--casualty rates were

much higher than projected. The 14 October 1943 second raid on the ball bearing plants at Schweinfurt proved to be the worst disaster in the history of air power. Of the 291 B-17's that left that day, 198 were lost or damaged; 60 aircrews never returned home.⁴⁶ Allied concern for German air superiority over its territory went further than the problems experienced by American daylight bomber raids; they were also concerned with the impending invasion of Normandy by the Anglo-American armies projected for May 1944.⁴⁷

Enter the P-51 Mustang long-range fighter in December 1943 to escort the bombers, coupled with accelerating aircraft production, and American air power indeed was recovering with a vengeance.⁴⁸ As the campaign grew, Germany found itself caught in a strategic vise grip. Initially, missions were flown out of Great Britain by RAF's Bomber Command and USAAF's Eighth Air Force. This group was soon joined by the activation of Fifteenth Air Force in November 1943 flying out of Italy, thus completing the squeeze on the Germans.⁴⁹

On 20 February 1944 began *The Big Week*, a six day assault on German aircraft-frame factories and assembly plants that crippled the capabilities of the Luftwaffe--a turning point that earned the Allies air superiority for the remainder of the war.⁵⁰ Attacking from both the north (England) and the south (Italy), by day (USAAF) and by night (RAF), sustained Allied bombings caused German aircraft production to fall by 20 percent.⁵¹ Perhaps more importantly, a total of 225 German flyers were killed, with another 141 wounded, representing 10 percent of their most experienced airmen.⁵²

As D-Day approached, the long-awaited invasion of Western Europe, the bomber offensive against Germany was in large part diverted for two months to attack the French

railway systems.⁵³ At that time, this effort represented the most highly successful and productive bombing attacks on a sustained scale ever carried out.⁵⁴

Following the invasion of Normandy and the breakout at St. Lo, the full Allied strategic mission resumed again. Successful attacks now on the German transportation system reduced levels of coal stocks for the railroads to 18 days in October 1944, four and one half days in February 1945, and less than one day in March 1945.⁵⁵ On 16 April 1945, the strategic air war in Europe was brought to a close. Twenty-one days later, on 7 May 1945, all hostilities in Europe ended.⁵⁶

When it was all over, the losses were heavy (one U.S. bomber lost in every 76 sorties, one RAF bomber lost in every 56.5 sorties) and effectiveness of the strategic concept seemed to be under constant scrutiny.⁵⁷ However, the overall effect of the CBO can probably be best appreciated when viewed through the eyes of the enemy. In his 15 March 1945 report to Hitler, Albert Speer, Reich Minister for Armaments and War Production, stated flatly; "The German economy is heading for an inevitable collapse within four to eight weeks."⁵⁸

The impact of the CBO could not be ignored--it forced Germany into a defensive posture, thereby utilizing scarce resources that would have otherwise been applied to the attack. For example: two million German soldiers were taken from the front lines to help provide for the air defense of their homeland; German aircraft production shifted to fighters designed for air defense rather than for offensive support on the battlefield; and, as German fuel production collapsed, both the Wehrmacht on the ground and the Luftwaffe in the air ceased to function as effective fighting forces.⁵⁹

One last observation from Albert Speer will be used to illustrate the success of the CBO campaign. "The Reich Marshal told his captors in 1945 that the reason strategic bombing failed to knock Germany out of the war was the failure to follow up on initial bombings. Regardless, these bombings caused Germany to divert enormous resources from other vital areas to repair the damage of strategic bombing and to defend against it. Speer estimated that Germany lost 10,000 heavy guns, 6,000 tanks, and 20,000 antiaircraft guns in 1943 alone, due to the bombing campaign. It was, he said, *Germany's greatest lost battle*".⁶⁰

Notes

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Chapter 3

The Plan to Bomb Ploesti – A Departure from Doctrine

The genesis for a raid on Ploesti could actually be traced back as early as June 1941. During that time, the Russians tried three times to bomb the oil refineries with small raids and little success.¹ When the United States entered the war later that year the bombing of Ploesti appealed to President Roosevelt not only because of its importance as a target, but also as a means to strike hard at the Germans.² At this time (early 1942), the war was not going well and morale was in short supply. The United States received a boost when Lieutenant Colonel Doolittle was able to surprise the Japanese by bombing Tokyo (April 1942) with sixteen B-25s taking off from the flight deck of the aircraft carrier Hornet.³

The next month, the United States went for another morale booster against Japan with a bombing raid again planned for Tokyo, this time by twenty-three B-24s.⁴ Named Halverson Project Number 63 (HALPRO) after the commander Colonel Halverson, this mission would cover 13,000 miles, leaving Florida and eventually reaching Chekiang, China from where the attack would be staged.⁵ Unfortunately, by the time that this force reached Khartoum in North Africa, the mission had to be scrubbed as the fall of Chekiang to the Japanese was imminent.⁶ With the campaign going badly in North Africa, General Marshall desperately searched for a way to slow down Field Marshal Rommel's tanks –

President Roosevelt agreed to use the HALPRO force against Ploesti in an attempt to slow the *Afrikakorps* source of fuel.⁷

On 12 June 1942, Ploesti became the first American bombing mission against a European target when thirteen HALPRO B-24s (remnants of the original 23 bomber force) were sent out to attack the Astra Romana refinery.⁸ Actual damage to the oil fields was negligible and none of the B-24s were lost to enemy action.⁹ The mission was significant on several counts – it was the first American heavy bomber mission into any target within German occupied Europe, and it was also the longest (a 2,600 mile round trip).¹⁰ Ironically, history does not acknowledge this secret mission on Ploesti as the first – instead, text books recognize the 17 August 1942 Eighth Air Force raid on the marshaling yards at Rouen, France as the official start to United States daylight bombing.¹¹ In any event, this small raid on Ploesti served as a wakeup call for Luftwaffe Colonel Gerstenberg (“The Protector”) who was responsible for the defense of the oil fields – he knew that this was only the beginning.¹²

The Challenges of Planning

The decision to conduct a massive attack on Ploesti was reached at the Casablanca Conference in January 1943.¹³ The Casablanca orders to knock out Ploesti were then handed over to General Arnold, Commander, USAAF, and his planning staff in March 1943 – Colonel Smart was made responsible for developing a plan to strike the oil fields.¹⁴

Several surveys conducted determined that it would take 1,370 planes in order to have a 90 percent chance of hitting Ploesti from high altitude.¹⁵ It would also take four to six weeks to fly nine, 120 plane missions to accomplish it – there simply were not enough

aircraft available to destroy Ploesti from high altitude.¹⁶ Also, in consulting with his oil expert who had once worked at the oil fields,¹⁷ Colonel Smart found that most of the refineries were situated in a six mile circle around Ploesti.¹⁸ In trying to bomb this outer ring, it appeared that Colonel Smart had been given a strategic challenge with no feasible tactical solution.¹⁹

The Low Level Solution

Colonel Smart's solution was to have the B-24s conduct their mission at low altitude - meaning "at tree top level".²⁰ He reasoned that the advantages would be that: (1) it would permit the greatest possible selective targeting and the most accurate bombing; (2) it would reduce civilian casualties; (3) it would give enemy antiaircraft gunners only a fleeting shot at the B-24s; (4) it would allow the B-24 gunners a chance to fire back at ground units; (5) it would deprive enemy fighters of half their normal sphere of attack; (6) it would bring the B-24s under the lowest level reached by German radar; (7) it would give the B-24s their best chance of surviving a crash landing; and (8) it would be contrary to the American doctrine of high-altitude bombing, and thus come as a complete surprise to the Germans.²¹

Tidal Wave

Colonel Smart's plan, code named Tidal Wave, was approved by General Arnold and presented to Roosevelt, Churchill, and the Combined Chiefs at the Trident Conference in May 1943.²² They also approved the plan but wanted the theater commander, General Eisenhower, to consent to the mission.²³ He did so, but with reservations from his staff. His advisors, General Spaatz and Air Chief Marshal Tedder

questioned the effectiveness of a single strike and anticipated a 40 percent loss rate²⁴ – it was regarded as a “panacea target”.²⁵

Colonel Smart recognized a flaw in his planning in that the B-24 was only partly designed for this mission. It had the speed and the range, but its relatively small bomb load was a major drawback, and its big, boxcar-like configuration was ill suited for a low level mission.²⁶ Nonetheless, Major General Brereton, Commander of Ninth Air Force, who would have to give the order, did so after studying target folders for two weeks – the raid was on for 1 August 1943.²⁷

The Aircrews

General Brereton had five bombardment groups: the 376th (thirty B-24s under Colonel Compton); the 98th (forty-six, Colonel Kane); the 44th (thirty-six, Colonel Johnson); the 93rd (thirty-six, Lieutenant Colonel Baker); and the 389th (thirty, Colonel Wood).²⁸ Colonel Compton’s and Colonel Kane’s groups had been based in Palestine and the Nile Delta to reinforce British Eighth Army by bombing shipping and harbors in the Mediterranean.²⁹ Colonel Johnson’s and Colonel Baker’s groups had been the B-24 component of U.S. Eighth Air Force in Great Britain, sent to reinforce the invasion of North Africa.³⁰ Colonel Wood’s group was newly arrived in Britain from the United States.³¹ In late June 1943, all were assembled at the airfields near Benghazi, Libya in support of the invasion of Sicily.³² Then, in mid-July, they were pulled off this duty to train for their raid on Ploesti.

Their Training

The aircrews lived in tents in the desert under miserable conditions. They had to deal with daily windstorms that required equipment to be continually cleaned. Good food was in short supply and this played havoc on the general health of the aircrews.³³

On 19 July 1943, the five bombardment groups were pulled from Sicily operations and training began for their low-level attack against Ploesti.³⁴ They were well briefed and receiving excellent intelligence. They had detailed maps of each of the refinery targets, accompanied by an oblique sketch of what it would look like to them as they made their final approach.³⁵ South of Benghazi in the desert was a full-scale plan of Ploesti painted on the ground with white wash. For two weeks prior to the raid they bombed the mock target with practice bombs. In their final dress rehearsal with live bombs, they destroyed the desert Ploesti in less than two minutes.³⁶ They were ready, but nothing could prepare them for the ferocious defenses that awaited them at the real Ploesti.

Notes

¹ James Dugan and Carroll Stewart, *Ploesti: The Great Ground – Air Battle of 1 August 1943* (New York: Random House, Inc., 1962), 26-27.

² Eric Larrabee, *Commander in Chief – Franklin Delano Roosevelt, His Lieutenants, and Their War* (New York: Harper & Row, Publishers, 1987), 241.

³ Leroy W. Newby, *Into the Guns of Ploesti* (Osceola, WI: Motorbooks International Publishers & Wholesalers, 1991), 12.

⁴ Kenn C. Rust, *The 9th Air Force in World War II* (Fallbrook, CA: Aero Publishers, Inc., 1970), 11.

⁵ Newby, *Guns of Ploesti*, 12.

⁶ Ibid., 13.

⁷ Michael Hill, *Black Sunday: Ploesti* (Atglen, PA: Schiffer Publishing Ltd., 1993), 14.

⁸ Rust, *9th Air Force*, 11.

⁹ Larrabee, *Commander in Chief*, 241.

¹⁰ Hill, *Black Sunday*, 14.

Notes

- ¹¹ Newby, *Guns of Ploesti*, 14.
- ¹² Larrabee, *Commander in Chief*, 241.
- ¹³ Hill, *Black Sunday*, 15.
- ¹⁴ Ibid.
- ¹⁵ Ibid.
- ¹⁶ Ibid.
- ¹⁷ Haywood S. Hansell Jr., *The Strategic Air War Against Germany and Japan: A Memoir* (Washington, D.C.: Office of Air Force History, 1986), 24.
- ¹⁸ Larrabee, *Commander in Chief*, 242.
- ¹⁹ Ibid.
- ²⁰ Hill, *Black Sunday*, 16.
- ²¹ Ibid.
- ²² Larrabee, *Commander in Chief*, 242.
- ²³ Newby, *Guns of Ploesti*, 17.
- ²⁴ Larrabee, *Commander in Chief*, 242.
- ²⁵ James Parton, *Air Force Spoken Here: General Ira Eaker and the Command of the Air* (Bethesda, MD: Adler & Alder, Publishers, Inc., 1986), 264.
- ²⁶ Leon Wolff, *Low Level Mission* (Novato, CA: Presidio Press, 1957), 196-197.
- ²⁷ Larrabee, *Commander in Chief*, 243.
- ²⁸ Newby, *Guns of Ploesti* 38.
- ²⁹ Larrabee, *Commander in Chief*, 243.
- ³⁰ Ibid., 244.
- ³¹ Ibid.
- ³² Ibid.
- ³³ Hill, *Black Sunday*, 25.
- ³⁴ Newby, *Guns of Ploesti*, 34.
- ³⁵ Larrabee, *Commander in Chief*, 244.
- ³⁶ Ibid.

Chapter 4

Today's Target is Ploesti

On 27 July 1943 the mission planners and brass were surprised by intelligence data obtained through a Rumanian pilot who defected – he stated that the defenses around Ploesti were some of the heaviest in Europe.¹ Up to this point, aircrews had been briefed that Ploesti's defenses were weak, with many guns and aircraft believed to be manned by Rumanians lacking enthusiasm for the war.² This could not have been further from the truth.

In the long lull since the HALPRO mission, a year ago June, Luftwaffe Colonel Gerstenberg had done his work well making the city – *Festung Ploesti* – an unconquerable fortress.³ Ploesti lies between two ridges. Along this high ground, Gerstenberg placed 237 antiaircraft guns, both 88 and 105mm.⁴ Eighty percent of these guns were manned by German crews.⁵ Within the refinery areas were barrage balloons, light-flak towers, and hundreds of machine guns.⁶ The main German air base was twenty miles to the east where there were four wings of Messerschmitt (Me) 109s, of which approximately half were flown by German pilots; another base nearby held night-fighting Me 110s.⁷ Other Luftwaffe units were also at his disposal in Greece and Italy, as well as Rumanian and Bulgarian units spread throughout the general area.⁸

Most threatening of all, and unknown to American planners, Gerstenberg had established an efficient radar detection net.⁹ This, coupled with a Signal Interception Unit near Athens which was decoding Ninth Air Force transmissions, provided Luftwaffe Fighter Command at Bucharest with the ability to track all aircraft.¹⁰

On the Way to Ploesti

On Sunday, 1 August 1943, 178 B-24s took off from Benghazi at dawn on their way to make history – the low-level bombing of the Ploesti refineries and oil fields. Colonel Compton's group was in the lead followed in succession by Baker's, Kane's, Johnson's, and Wood's, all under the command of Brigadier General Ent who was flying with Compton.¹¹ Each B-24 carried approximately 3,100 gallons of fuel and an average load of 4,300 pounds of bombs and bullets, thus exceeding their maximum load capability – getting each aircraft off the ground was a major undertaking.¹²

Once the air fleet was assembled it headed north across the Mediterranean at two to three thousand feet maintaining radio silence to avoid detection by the Germans. Unfortunately, this precaution was to no avail.¹³ The Germans picked them up almost immediately. An informal message sent to other Allied forces in North Africa announcing their departure from Benghazi was decoded in Athens and relayed to Luftwaffe Fighter Command which went on alert.¹⁴

As Colonel Compton's group approached the island of Corfu, bad luck struck. The lead plane began to stagger and then inexplicably crashed into the sea.¹⁵ Then, another B-24 violated procedures and went down to investigate – it was unable to regain altitude and had to head for home.¹⁶ With the loss of these two planes went both the mission

navigator and his back-up. At this point, the force was now down to 165 B-24s – other aircraft had aborted the mission due to mechanical difficulties.¹⁷

As the group swung northeastward across Albania and Yugoslavia an already stretched out force grew farther apart. As they approached a mountain range with heavy cloud cover, four of the group commanders chose to fly over the clouds – Colonel Kane went under them.¹⁸ When they came out of the other side at the Bulgarian border, not only was their attack sequence mixed up, but Colonel Kane's group was left far behind.¹⁹ Once over the mountains in Bulgaria, the group dropped down and disappeared off of German radar screens. It didn't matter. The Germans knew that the Americans were headed for Ploesti and scrambled their fighter forces.²⁰

Despite the loss of both mission navigators, the main force (Colonel Kane's had fallen behind) made their initial point (IP) at Targovisti.²¹ Unfortunately, at this point, on General Ent's order, the mission took a wrong turn and instead of moving on Ploesti, instead was heading for Bucharest.²² The confusion had started and Gerstenberg's flak and fighters were about to make things worse.

Over The Target

Colonel Baker was the first group to correct the mistake and head towards Ploesti. As his group closed in, the skies filled with flak and barrage balloons.²³ As they began their attack, Colonel Baker's plane caught fire and crashed as oil storage tanks began to explode all around. Of the thirty-two planes that reached the target area (Concordia Vega Refinery), only fifteen emerged, now to face the wrath of German fighters.²⁴

Colonel Compton corrected his approach soon after Colonel Baker did, approaching Ploesti from the south. Heavy flak forced them eastward and General Ent ordered an

attack on targets of opportunity.²⁵ Part of his force hit one of the major cracking plants (Concordia Vega Refinery) eliminating forty percent of its capacity.²⁶ The remaining force was not able to find targets and dumped their bombs north of Ploesti.²⁷

At this point, other groups arrived over the target area from different directions, and now the biggest problem for the B-24s became to avoid hitting one another.²⁸ Meanwhile, Gerstenberg marveled at the precision with which the B-24s maneuvered over Ploesti, unaware that this was actually the result of a plan that had gone bad.²⁹

Colonel Wood's group turned in a great performance on this day. After also compensating for the wrong turn, they totally destroyed their target (Steaua Romana Refinery). This refinery would not be back in production for six months. Only six planes were lost out of the twenty-nine that attacked Ploesti.³⁰

Colonel Posey's group of twenty-one B-24s from Colonel Johnson's force also performed well.³¹ They were assigned an aviation fuel plant north of Ploesti (Creditul Minier Refinery) which was the most modern facility in Europe. They lost only two planes, and their target was knocked out of operation for the rest of the war.³²

Finally, Colonel Kane's and the remainder of Colonel Johnson's group attacked from the south entering a smoke filled Ploesti (from previous attacks), complicated by delayed-action bombs still going off.³³ Flak was so heavy that eight of the fifty-seven bombers from the two groups were hard hit before reaching the target area.³⁴ Colonel Johnson lost five aircraft over Ploesti, Colonel Kane lost fifteen, but they were successful in destroying half the productive capacity of the largest oil refineries (Astra Romana, Phoenix-Orion, and Columbia Aquila) in Europe.³⁵

On the way home, German fighters began picking up the battered bombers as they left Ploesti. Initially, the low altitude made it difficult for the Me 109s to effectively attack the B-24s without they themselves crashing into the ground. Unfortunately, the German fighter pilots learned to improvise their tactics and took down their share of B-24s.³⁶

The Aftermath

The final count on aircraft was staggering. Of the force that departed for Ploesti, ninety-three returned to Benghazi, nineteen landed at other Allied airfields, seven landed in Turkey, and three crashed at sea.³⁷ The final figures showed that fifty-four planes were lost (forty-one in combat) and 532 men were either dead, captured, missing, or interned (out of a total of 1,726).³⁸

If it had not been for the wrong turn made at Targovisti, there is every indication that the Ploesti mission would have succeeded in accomplishing all of its objectives; destroying ninety percent of the refinery complex.³⁹ Instead, in the confusion that followed, the Romano Americana, Standard Petrol, and Unirea Sperantza Refineries were never touched at all.⁴⁰

History has since concluded that Ploesti, as a whole, had lost forty-two percent of total capacity, that cracking plant production had been cut by forty percent, and that the production of lubricating oils had been considerably reduced.⁴¹ Unfortunately, none of this made very much difference since Ploesti had been running at only sixty percent of capacity.⁴² This meant that the effective long-term loss was not forty two percent, but rather two percent. Thus, idle plants were activated, others repaired, and within weeks Ploesti was producing at a higher rate than before the raid.⁴³

Notes

- ¹ Michael Hill, *Black Sunday: Ploesti* (Atglen, PA: Schiffer Publishing Ltd., 1993), 34.
- ² Eric Larrabee, *Commander in Chief – Franklin Delano Roosevelt, His Lieutenants, and Their War* (New York: Harper & Row, Publishers, 1987), 244.
- ³ James Dugan and Carroll Stewart, *Ploesti: The Great Ground – Air Battle of 1 August 1943* (New York: Random House, Inc., 1962), 29.
- ⁴ Leroy W. Newby, *Into the Guns of Ploesti* (Osceola, WI: Motorbooks International Publishers & Wholesalers, 1991), 18.
- ⁵ Larrabee, *Commander in Chief*, 245.
- ⁶ Ibid.
- ⁷ Ibid.
- ⁸ Dugan and Stewart, *Ploesti*, 71-72.
- ⁹ Larrabee, *Commander in Chief*, 245.
- ¹⁰ Dugan and Stewart, *Ploesti*, 86-87.
- ¹¹ Larrabee, *Commander in Chief*, 245.
- ¹² Dugan and Stewart, *Ploesti*, 83.
- ¹³ Ibid., 85.
- ¹⁴ Ibid., 86-90.
- ¹⁵ Larrabee, *Commander in Chief*, 246.
- ¹⁶ Hill, *Black Sunday*, 49-50.
- ¹⁷ Dugan and Stewart, *Ploesti*, 93-94.
- ¹⁸ Larrabee, *Commander in Chief*, 246.
- ¹⁹ Kenn C. Rust, *The 9th Air Force in World War II* (Fallbrook, CA: Aero Publishers, Inc., 1970), 39-40.
- ²⁰ Dugan and Stewart, *Ploesti*, 99.
- ²¹ Hill, *Black Sunday*, 55.
- ²² Ibid.
- ²³ Rust, *9th Air Force*, 40-42.
- ²⁴ Ibid., 42.
- ²⁵ Dugan and Stewart, *Ploesti*, 138-139.
- ²⁶ Larrabee, *Commander in Chief*, 248.
- ²⁷ Ibid.
- ²⁸ Newby, *Guns of Ploesti*, 78-79.
- ²⁹ Ibid.
- ³⁰ Ibid., 80-84.
- ³¹ Larrabee, *Commander in Chief*, 249.
- ³² Hill, *Black Sunday*, 127.
- ³³ Larrabee, *Commander in Chief*, 249.
- ³⁴ Ibid.
- ³⁵ Ibid., 250.
- ³⁶ Hill, *Black Sunday*, 158-159.
- ³⁷ Larrabee, *Commander in Chief*, 250.
- ³⁸ Ibid.
- ³⁹ Rust, *9th Air Force*, 42.

Notes

⁴⁰ Ibid.

⁴¹ Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II – Volume Two – Europe: Torch to Pointblank – August 1942 to December 1943* (Chicago, IL: The University of Chicago Press, 1949), 483.

⁴² Leon Wolff, *Low Level Mission* (Novato, CA: Presidio Press, 1957), 177, 183.

⁴³ Ibid.

Chapter 5

Retrospect and Assessment

Although it has been argued that Ploesti was not a strategic success, many considered it to be a pronounced moral victory for the Allies, especially the Americans. To Europeans, Tidal Wave was proof that American aircrews were brave enough to fight amongst their own exploding bombs.¹ They showed that they could deliver bombs accurately on military objectives with a minimum toll on civilians. This made a big impression on the people of Europe who despised the inaccurate Allied high level bombings that killed many innocent people. They considered this mission as the last great act of chivalry in aerial bombing.²

Reaction to the attack by the German and Rumanian military at Ploesti was one of sheer admiration for the audacity and daring of the Americans. At General Gerstenberg's direction, the American dead at the attack site were given funerals with full military honors.³ The Rumanian women held wakes for the Americans, and on the caskets they placed special thin cakes – each with a small American flag made of colored candies. A German officer asked why these women did this and were crying for the Americans. One lady replied, “We cry, because we know American mothers soon will be crying for their sons.”⁴

In providing my personal assessment of the Ploesti raid, my primary focus will revolve around the question I set forth at the outset of this paper. After building a doctrine for twenty years based on high altitude, daylight, precision bombing, why, in its first major bombing effort, did the United States “depart from doctrine” and conduct a low level bombing mission on Ploesti, the only low level bombing mission conducted in the war? In answering this question, my analysis will consider four areas: (1) the departure from doctrine – from what you do best; (2) the need for surprise in attacking Ploesti; (3) the fallacy of the belief in a single strike; and (4) the flexibility that air power offers in planning.

Do What You Do Best

Doctrine, simply defined, is determining the best way to do something. For the United States leading up to WWII, in terms of strategic bombing, this was stated as high altitude, daylight, precision bombing. As we have seen, American theorists went to great lengths to carefully mold our military doctrine in this area. Our training, our weapons, our tactics all supported and revolved around this doctrine. We trained a force to fly and fight in bombers. We developed long range bombers to strike the enemy at great distances. We heavily armed these bombers so they would be defensive fortresses. We developed the Norden bombsight to allow bombing precision at high altitudes. We developed tactics such as flying in tight box formations to provide the greatest concentration of firepower against an attacking enemy. In a nutshell, this was the bombing doctrine of the Army Air Corps with all its “bells and whistles”. Although we had not had the opportunity to use this doctrine in conflict, it was what airmen felt that they did best!

Ploesti was a great challenge as a target, make no mistake about that, and the logic for conducting the low level mission was sound, reasonable, and appropriate. However, our bombing doctrine was completely untested at this point. For all we knew, and should have believed, high altitude bombing could have just as easily done the job – there were no lessons learned to indicate otherwise. We had not yet had the horrible experiences of Regensburg and Schweinfurt (August 1943)⁵ and then Schweinfurt again (October 1943).

It is truly a virtue to be adaptable and not get caught up in dogma – ask anyone who lived through the horrors of trench warfare in WWI; a change in doctrine would certainly have been appreciated there. However, Ploesti was not the place. It was the first time on a large scale to test our doctrine. Leadership owed it to the men that they sent to fight and die to do so as they were trained – to allow them to do what they did best!

Many brave and gallant airmen fought and died in the raid on Ploesti, and in hindsight, losses turned out to be just as catastrophic as Regensburg and Schweinfurt. It was a mission that required great timing, incredible luck, and courageous airmen. Unfortunately, we only had the last of these three, and for that we paid dearly.

The Element of Surprise

Much has been written concerning the element of surprise in the choice of low level bombing against Ploesti. Among other reasons, Colonel Smart believed that the Germans would be caught off guard since our established doctrine was to bomb at high altitude. Also, flying low would place the bomber force below the detection capability of German radar and, coupled with radio silence, would ensure their arrival at Ploesti unannounced. This was an ambitious undertaking given the long distance (an approximately 2,400 mile

flight) that the bombers needed to travel to reach their respective targets.⁶ However, the airmen exhibited great discipline in carrying out this aspect of the mission.

Unfortunately, surprise was the last thing that Tidal Wave had going for it. As we know now, all of Ploesti's defenses were poised and waiting for General Ent's bombers. Completely unknown to the Americans was the fact that the Germans had broken the Ninth Air Force code and they knew the moment that the attacking force departed their Benghazi airfields. With the extensive radar network that they had established, the Germans easily tracked the bombers until they dropped down to attack Ploesti and by that time the Luftwaffe was up in force and the city was on full alert.

Despite all of the above, I maintain that the element of surprise was actually lost long before 1 August 1943. I believe we tipped our hand over a year earlier when we conducted the HALPRO mission against Ploesti on 12 June 1942. At that time, in what turned out to be a token effort as an afterthought, we alerted the Germans that we were thinking about Ploesti. This message was not lost on them. They put this thirteen-month advance warning to good use by building Ploesti into a defensive fortress. Gerstenberg received all the support he needed from Hitler (through Goering), and was solely responsible for making Ploesti one of the toughest targets in the Third Reich.⁷

The Single Strike Fallacy

Ironically, although we may have compromised our high altitude doctrine at Ploesti, we clutched to our belief that any target could be knocked out in a single strike; one decisive blow. Obviously, Ploesti became our first major lesson learned that this was not so. As the war progressed we would learn that targets needed to be struck hard, but then frequent follow-up missions were also needed to inhibit German repair efforts.

The limited success at Ploesti was only temporary. The refineries were quickly reconstituted. During the long lull following the HALPRO mission the refineries had plenty of time to develop workarounds in the event of damage during a bombing raid. The Germans put these ideas to good use in getting back on their feet following Tidal Wave. Also, it was unfortunate for the Americans that at that time Ploesti was only operating at sixty percent capacity. Therefore, in no time, Ploesti refineries were producing at a level higher than before the raid.

The assault on Ploesti would continue – Fifteenth Air Force would pick up the banner on 5 April 1944 and carry it until 19 August 1944.⁸ When Russian troops marched into Ploesti on 30 August, they found it literally shut down, but Fifteenth Air Force had also paid the price. Nineteen high level missions were flown during that time – 5,479 sorties – 223 bombers lost – almost 1.2 million tons of oil production destroyed. Ploesti became known as the “grave yard of the bombers”.⁹

Flexibility is the Key to Air Power

In many ways, the low level raid on Ploesti would be one of many historical events leading the way to a future trend of increasingly high expectations on the capabilities of air power. Air power’s most enduring quality, flexibility – its remarkable adaptability and ability to react quickly, has placed it squarely in the middle of today’s plans for the future national security of the United States. At the time, Ploesti proved how quickly the Air (Force) Corps could “change direction on the fly” and perform a unique mission; one that was not considered by the visionaries of the interwar period.

Preparations for the mission to Ploesti were a relatively fast process. Several months of planning were followed by extensive coordination up and down the command structure

– Roosevelt gave the order at Casablanca and approved the plan at Trident. Training for this special raid took only a couple of weeks. Along the way, many obstacles were overcome; carrying extra fuel to allow the B-24s to reach Ploesti, changing from the high altitude Norden bombsight to low level manual targeting,¹⁰ and adjusting fuses on bombs to delay detonation and allow the force to clear the area, and all the while, security was of the utmost importance in the hope of maintaining an element of surprise. It was truly an impressive undertaking by a fledgling Air Corps.

Today, air power is an integral player in the national security arena – its ability to react quickly is at the center of all decisionmaking. Whether it's a B-2 crossing the globe in a show of force projection, squadrons of F-15s deploying to conduct a possible halt phase, or the soon-to-be employed concept of the Air Expeditionary Force (AEF) ready to answer the call in some future hostile action, the genesis for all of these started with the early potential exhibited by air power at places like Ploesti and other air operations like it.

Here possibly lies an explanation to the departure from doctrine question – flexibility and the ability to react quickly. Colonel Smart and his planning staff realized that air power, in this case strategic bombing, had potential at other than high altitude – and they employed it. Air power offered other options, and they were continuing the process of breaking new ground – a process that started with the air power visionaries of the 1920s and 30s, and one that would continue for the next fifty-plus years, leading to our modern day Air Force.

In Memory of...

Tidal Wave went into the annals of Air Force history as one of the bloodiest and most heroic missions of all time. Other missions would go back to Ploesti, but Tidal Wave would stand as “one of a kind” – the only low-level bomber mission of the war.¹¹

More decorations for bravery were awarded than any other mission in the history of aerial combat. There were five Medals of Honor, a Distinguished Flying Cross for every airmen, 430 Purple Hearts, along with numerous Distinguished Service Crosses, Distinguished Service Medals, Silver Stars, Bronze Stars, and Legion of Merits – approximately 2,500 total decorations for this single mission.¹²

They were ordinary men who exhibited extraordinary valor!

Notes

¹ James Dugan and Carroll Stewart, *Ploesti: The Great Ground – Air Battle of 1 August 1943* (New York: Random House, Inc., 1962), 243-244.

² Ibid., 244.

³ Leroy W. Newby, *Into the Guns of Ploesti* (Osceola, WI: Motorbooks International Publishers & Wholesalers, 1991), 100.

⁴ Ibid., 100-101.

⁵ Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II – Volume Two – Europe: Torch to Pointblank – August 1942 to December 1943* (Chicago, IL: The University of Chicago Press, 1949), 483.

⁶ H. H. Arnold, *Global Mission* (New York: Harper & Brothers, Publishers, 1949), 494.

⁷ Dugan and Stewart, *Ploesti*, 26.

⁸ Leroy W. Newby, *Target Ploesti: A View from a Bombsight* (Novato, CA: Presidio Press, 1983), 210.

⁹ Ibid., 211.

¹⁰ Newby, *Guns of Ploesti*, 23.

¹¹ Michael Hill, *Black Sunday: Ploesti* (Atglen, PA: Schiffer Publishing Ltd., 1993), 193.

¹² Ibid.

Appendix A

Comparison Of Strategic Bombing Plans

AWPD-1	AWPD-42	CBO
<u>Target Priorities</u>	<u>Target Priorities</u>	<u>Target Priorities</u>
1. German Air Force Aircraft Factories Aluminum Plants Magnesium Plants Engine Factories	1. German Air Force Aircraft Factories Aircraft Engine Plants Aluminum Plants	1. German Air Force Fighter Aircraft Factories Aircraft Engine Plants Combat Attrition
2. Electric Power Power Plants Switching Stations	2. Submarine Building Yards	2. Submarine Building Yards and Bases
3. Transportation Rail Water	3. Transportation Rail Water	3. Ball Bearings
4. Petroleum Refineries and Synthetic Plants	4. Electric Power Power Plants Switching Stations	4. Petroleum Refineries and Synthetic Plants
5. Morale	5. Petroleum Refineries and Synthetic Plants	5. Rubber Synthetic Plants
	6. Rubber Synthetic Plants	6. Military Transportation Armor Vehicle Factories Motor Vehicle Factories
Total Targets - 191	Total Targets - 177	Total Targets – 76 ¹

Notes

¹ Haywood S. Hansell Jr., *The Air Plan That Defeated Hitler* (New York: Arno Press, 1980), 163.

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